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(72) Bradley, George C., CA
(71) Bradley, George C., CA

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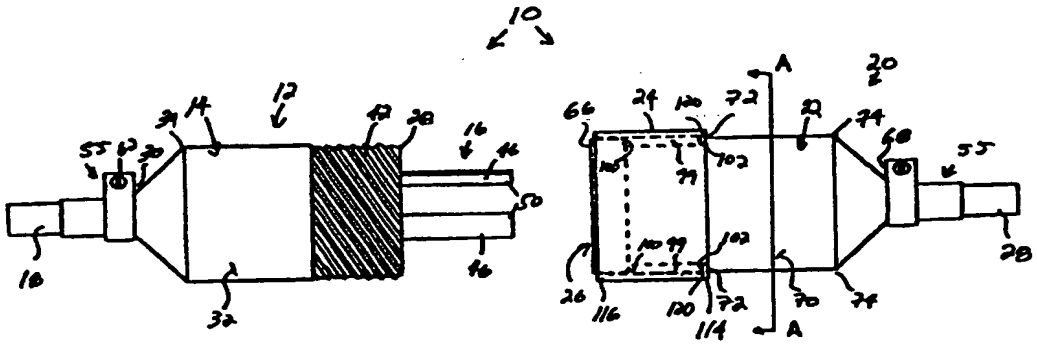
(54) **PRISE ELECTRIQUE AVEC DISPOSITIF DE VERROUILLAGE FILETE**

(54) **ELECTRICAL PLUG WITH THREADED INTERLOCK**



(57) Le connecteur électrique avec un dispositif de verrouillage fileté comprend une prise électrique mâle comportant un corps et des bornes électriques mâles, et une prise électrique femelle comportant un corps et des bornes électriques femelles. Une des prises est filetée à l'extérieur; le filetage se prolonge le long du corps de la prise en s'éloignant des bornes électriques. L'autre prise comporte un anneau cylindrique monté sur elle de façon coulissante et rotative. L'anneau est fileté à l'intérieur de façon que le filetage interne coopère avec le filetage externe de la prise filetée à l'extérieur. Il peut passer d'une position rétractée dans laquelle il ne touche pas aux bornes électriques à une position allongée dans

(57) The electrical connector with threaded interlock comprises a male electrical plug having an plug body and male electrical terminals, and a female electrical plug having an plug body and female electrical terminals. One of the plugs is externally threaded with the threads extending along the body of the plug in a direction away from the electrical terminals. The other of the plugs has a cylindrical collar member slidably and rotatably mounted on it. The collar member is internally threaded such that the internal threads may cooperate with the external threads on the externally threaded plug. The collar member is moveable between a retracted position with the collar member clear of the electrical

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laquelle son filetage interne s'engage avec le filetage externe de sorte que les deux prises, mâle et femelle, peuvent être verrouillées l'une à l'autre. Puisque la partie filetée à l'extérieur s'éloigne des bornes électriques et que l'anneau se rétracte à une position dans laquelle il ne touche pas aux bornes, le connecteur n'entrave pas les bornes électriques de la prise mâle ou femelle, ce qui permet à une prise comprenant soit le filetage externe, soit l'anneau, d'être utilisée conjointement avec une prise ordinaire sur un cordon d'alimentation ou avec une prise murale ordinaire.

terminals, and an extended position such that the internal threads of the collar member can be moved into contact with the external threads for engagement with each other thereby securing the male and female plugs together. Since the external threaded portion extends in a direction away from the electrical terminals, and the collar member is retractable to a position clear of electrical terminals, the connector does not interfere with the electrical terminals of either the male or female plug. This allows a plug having either the external thread or the collar member to be used with a standard plug on a power cord, or with a standard wall outlet.

**ABSTRACT**

The electrical connector with threaded interlock comprises a male electrical plug having an plug body and male electrical terminals, and a female electrical plug having an plug body and female electrical terminals. One of the plugs is externally threaded with the threads extending along the body of the plug in a direction away from the electrical terminals. The other of the plugs has a cylindrical collar member slidably and rotatably mounted on it. The collar member is internally threaded such that the internal threads may cooperate with the external threads on the externally threaded plug. The collar member is moveable between a retracted position with the collar member clear of the electrical terminals, and an extended position such that the internal threads of the collar member can be moved into contact with the external threads for engagement with each other thereby securing the male and female plugs together. Since the external threaded portion extends in a direction away from the electrical terminals, and the collar member is retractable to a position clear of electrical terminals, the connector does not interfere with the electrical terminals of either the male or female plug. This allows a plug having either the external thread or the collar member to be used with a standard plug on a power cord, or with a standard wall outlet.

# Electrical Plug with Threaded Interlock

## FIELD OF THE INVENTION

The present invention relates to electrical connectors, particularly of the type having means for holding connected male and female plugs together.

## BACKGROUND

Electrical devices often have power cords for communicating power from a remote power source to the electrical device. The power cord generally extends from the electrical device to a male plug at the end of the cord. This male plug then connects to a female plug which may be part of an extension cord, or an electrical outlet. When working with an electrical tool or other device attached to an extension cord the user often has the problem of keeping the interconnected plugs from being pulled apart in the course of working with the tool.

The problem of holding together connected male and female cords has been addressed in the past by a number of prior devices. R. I. Markey in U.S. Patent 2,306,821 (December 29, 1942) teaches a disconnect plug having a male portion housed in a cylindrical shroud surrounded by an internally threaded thimble and a female portion having an externally threaded sleeve. When the male and female portions are connected the cylindrical shroud surrounding the male portion extends past the end of the prongs of the male electrical connector and engages between the female portion of the coupling and the surrounding sleeve. The internally threaded thimble on the male portion engages the externally threaded sleeve of the female portion thus holding the two plugs connected preventing them from being pulled apart.

De Man et al in U.S. Patent 3,430,187(February 25, 1965) - Marine Plug, shows a male plug similar to Markey having an internally threaded thimble and a shroud which extends over and past the prongs of the plug. The male plug engages an externally threaded female plug.

Blaetz in U.S. Patent 5,299,951 (April 5, 1994) - Housing for an Electrical Connector, Osten U.S. Patent 5,505,634 (April 9, 1996) - Cord Connector, and Ryan in U.S. Patent 4,784,612 (November 15, 1988) - Electric Plug Holder each shows a housing which encloses conventional male and female plugs of electrical extension cords. The housings have threaded portions that screw together holding the male and female portions of the plugs together.

Blaetz and Ostin, like Markey and De Man, each shows a housing for the male plug which extends past most or all of the prongs on the male electrical connector enclosing and protecting the prongs. This arrangement makes it difficult or impossible to use the male connector with standard wall outlets and with female connectors on power cords that do not have a corresponding specialized female portion.

Ryan teaches a holder for electrical cords having male and female portions which hold the male and female plugs together. The male and female portions of the holder are not fastened onto the cord or the electrical plugs. Instead each portion includes a slot which allows it to be slidably positioned on the cord. The male and female portions of the holder are free to move along the length of the cord when not connected to each other. Since the male and female portions of the holder simply slide over the cord they can fall off of the cord when not connected to one another if the cord slides back through the slot. This can make this type of holder inconvenient and difficult to use.

**SUMMARY**

According to the present invention there is provided an electric connector comprising:

a male electrical plug including a male plug body having a first end, and male electrical terminals comprising a plurality of prongs extending outwards and past the first end of the plug body;

a female electrical plug including a female plug body having a first end, and female electrical terminals comprising a plurality of receptacles extending into the female plug body from the first end thereof and arranged to receive the prongs of the male plug;

a first one of said electrical plugs having an external thread arranged at the first end of the body thereof;

and a second one of said electrical plugs having a cylindrical collar member mounted thereon, said cylindrical collar member having a first end and an internal thread at the first end arranged for cooperation with the external thread;

and wherein the cylindrical collar member is mounted on the body of the second one of the plugs for free rotational movement therearound and for translational movement therealong between a retracted position with the first end of the collar member lying adjacent the first end of the second plug body, and an extended position with the first end of the collar member extending past the first end of the second plug body such that the internal thread can cooperate with the external thread to selectively secure the first one of the plugs to the second one of the plugs.

Preferably the body of the second one of the plugs includes an annular recess in an outer surface thereof and spaced from the first end thereof; and wherein the collar member includes a stopper member

extending radially into the annular recess limiting translational movement of the collar member on said body between the retracted and extended positions.

The connector does not interfere with the electrical terminals of either the male or female plug as the external threaded portion extends along the body in a direction away from the terminals, and the collar member is retractable to a position clear of the terminals. This allows a plug having either the external thread or the collar member to be used with most power cord plugs, or with most wall outlets.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, which illustrate an exemplary embodiment of the present invention:

Figure 1 shows a side view of the male plug with the external thread and the female plug with the collar member disconnected from one another;

Figure 2 is a cross sectional view of the male plug with the external thread and the female plug with the collar member, disconnected from one another;

Figure 3 is a side view of the male plug with the external thread and the female plug with the collar member, connected to one another;

Figure 4 is a cross sectional view of the male plug with the external thread and the female plug with the collar member, connected to one another;

Figure 5 is a cross sectional side view of an alternative arrangement of the male and female plugs showing the spring biasing means on the collar member and the electrical plug disconnected;

Figure 6 is a cross sectional side view of an alternative arrangement of the male and female plugs showing the spring biasing means on the collar member and the electrical plug connected together;

Figure 7 is a cross sectional side view of a wall outlet with the collar member mounted thereon;

Figure 8 is a view of the female plug through line A-A of Figure 1.

Figure 9 is a cross sectional side view of an alternative arrangement of the male plug with the collar member and the female plug with the external thread disconnected from one another;

Figure 10 is a cross sectional side view of an alternative arrangement of the male plug with the collar member and the female plug with the external thread connected to one another;

Figure 11 is an alternative arrangement of the a wall outlet with the external thread and the male plug disconnected from one another; and

Figure 12 is an alternative arrangement of the a wall outlet with the external thread and the male plug connected to one another.

**DETAILED DESCRIPTION**

Referring to Figures 1 to 4 the electrical connector with threaded interlock is shown generally at 10. The electrical connector with threaded interlock 10 comprises a male electrical plug 12 and a female electrical plug 20. The male electrical plug 12 includes a body 14, male electrical terminals 16, and a cord 18. The female electrical plug 20 includes a body 22, a cylindrical collar member 24, female electrical terminals 26, and a cord 28.

The body 14 of the male electrical plug 12 comprises a cylindrical tubular member extending from a first end 28 to a second end 30

and has an outer cylindrical wall 32. The outer wall 32 extends rearwards at a constant diameter from the first end 28 to a point 34 spaced from the second end 30 and then tapers inwards to a longitudinal centre line 36 to the second end 30. This gives the portion of the plug body 14 adjacent the second end 30 a frusto conical shape.

The plug body 14 has an inner cavity 36 which extends from the first end 28 of the plug body 14 to the second end 30 of the plug body 14. A first opening 38 is arranged at the first end 28 and a second opening 40 is arranged at the second end 30.

An external thread 42 extends from the first end 28 along an outer surface of the outer wall 32 of the plug body 14 and away from the electrical terminals 16. The external thread 42 is engaged by the cylindrical collar 24 of the female electric plug 20 to hold the male and female portions together.

The male electrical terminals 16 comprises a plurality of prongs 46. A face plate 44 is arranged within the first opening 38 in the body 14 at the first end 28 thereof to receive the prongs 46. The plurality of prongs 46, generally two prongs if no ground wire is needed, or three if a ground wire is required, extend through the face plate 44 from an interior end 48 to an exterior end 50 and outwards from the face plate 44 past the first end 28 of the body 14.

The electrical power cord 18 extends through the second opening 40 and into the cavity 36 terminating at an end 52. The end 52 of the cord 18 resides within the plug body 14 and divides into a plurality of individual electrical wires 54 the number of which corresponds to the number of prongs 46. Each wire 54 is connected to a corresponding prong 46 at the interior end 48 thereof. The wires 54 may be connected to the

prongs 46 by any one of a number of well known methods for connecting wires to electrical connectors.

The electrical power cord 18 is fixed to the second end of the male electrical plug 12 by fixing means 55 comprising an elongate tubular member 56 which extends out through the second opening 40 from a first end 58 located within the cavity 36 to a second end 60 located outside of the plug body 14. The first end 58 includes an annular shoulder 59 which is sized and arranged to engage the outer wall 32 of the plug body 14 at the second opening 40. The shoulder 59 prevents the elongate tubular member 56 from being pulled through the opening 40.

The cord 18 is arranged to extend through the elongate tubular member 56 and is held in place relative to the elongate member 56 by a clamp 62 which extends around an outer portion of the tubular member 56 and the cord 18 and compresses the tubular member 56 into the cord 18 thereby holding them fast to one another. Movement of the cord 18 relative to the second end 30 of the plug body 14 is prevented by the shoulder 59 within the cavity 36 of the plug body 14 and the clamp 62 on the elongate member and cord 18 lying outside the plug body 14.

The body 22 of the female electrical plug 20 is an elongate tubular member and extends from a first end 66 to a second end 68 and has collar member 24 arranged for movement on an outer surface 70 thereof. An annular recess 99 extends along the outer surface 70 of the body 22 from a first end 100 spaced inwards from the first end 66 of the body 22 to a second end 102 spaced inwards from the second end 68 of the body 22.

The body 22 of the female plug 20 comprises first and second portions 67 and 86 which are removably and reengageably separable at the

annular recess 99 such that the collar 24 may be positioned around and retained on the plug body 22 at the annular recess 99.

The first tubular portion 67 extends from the first end 66 of the plug body 22 to an end 88. The annular recess 99 extends along the first tubular portion 67 from a position spaced in from the first end 66 of the plug body 22 to the end 88 of the first tubular portion 67. An external thread 94 extends along an outer surface of the first tubular portion 67 from the end 88 towards the first end 66. The external thread 94 is arranged for cooperation with the internal thread 84 of the second portion 67 of the plug body 22.

The second tubular portion 86 extends from an end 72 having a diameter greater than the annular recess 99 to a point 74 spaced from the second end 68 and then tapers inwards towards the longitudinal centre line 36 to the second end 68. The outer cylindrical wall 82 of the second portion 86 includes an internal threaded portion 84 extending inwards from the end 72 and along an inner surface the wall.

A cavity 76 extends from the first end 66 to the second end 68 of the plug body 22. A first opening 71 is arranged at the first end 66 of the plug body 22 and a second opening 80 is arranged at the second end 68 of the plug body 22.

The female electric plug 20 includes female electric terminals 26 comprising a plurality of receptacles 108. A face plate 106 is positioned within the first opening 70 in the plug body 22 at the first end 66 thereof to receive the receptacles 108. The plurality of receptacles 108 comprise two or three receptacles corresponding to the number of tines on the male plug 12, and extend inwards from an end 110 adjacent the first end 66 to an inner end 112 within the cavity 76. Each receptacle is sized and arranged

to receive a corresponding prong member 46 of the male plug 12 when the male and female plugs 12 and 20 are connected together.

Referring to Figures 1 and 8 the cavity 76 within the plug body 22 has insulated partitions one for each of the plurality of receptacles 108, each partition 113 extends from the first end 66 of the shell 22 past the inner end 112 of each receptacle 108. The partitions 113 help prevent the wires 54 from accidentally coming into contact with one another.

Referring to Figures 1 to 4 the female plug 20 includes the electrical power cord 28 fixed to the second end 68 of the plug body 22 in the same manner as the electrical power cord 18 on the male electrical plug 12. The fixing means 55 similarly comprise an elongate tubular member 56 which extends out through the second opening 80 from a first end 58 located within the cavity 76 to a second end 60 located outside of the plug body 22. The first end 58 includes an annular shoulder 59 which is sized and arranged to engage the outer wall 32 of the plug body 22 at the second opening 80. The shoulder 59 prevents the elongate tubular member 56 from being pulled through the opening 80.

The cord 28 is arranged to extend through the elongate tubular member 56 and is held in place relative to the elongate member 56 by a clamp 62 which extends around an outer portion of the tubular member 56 and the cord 28 and compresses the tubular member 56 into the cord thereby holding them fast to one another. Movement of the cord 28 relative to the second end 68 of the plug body 22 is prevented by the shoulder 59 within the cavity 36 of the plug body 22 and the clamp 62 on the elongate member and cord 28 lying outside the plug body 22.

The female electrical plug 20 also includes the cylindrical collar member 24 which extends from a first end 114 to a second end 116 and is

slidably mounted on the plug body 22 for rotational movement therearound and for translational movement therealong. The collar member is capable of translational movement from a retracted position with the first end 116 of the collar member 22 lying between the first and second ends 66 and 68 of the plug body 22, and an extended position with the first end 116 of the collar member 24 extending outwards and past the first end 66 of the plug body 22. The collar member has an internal thread 118 extending from the first end 116 and along an inner surface thereof. The internal thread 118 is arranged for cooperation with the external thread 42 of the outer wall 32 of the body 14 of the male plug 12 when the collar member 24 is in the second position. This allows for male and female plugs 12 and 20 to be removably and reengageably secured to one another.

The collar member 24 includes a stopper member 120 which extends radially inwards from the inner surface thereof. The stopper member 120 is arranged to lie between the first and second ends 100 and 102 of the annular recess 99. The collar member 24 is mounted on the plug body 22 such that moving the collar member 24 in a first direction to the first position causes the stopper member 120 to contact the first end 102 of the annular recess 99 preventing further movement in the first direction and such that moving the collar member 24 in a second direction to the second position causes the stopper member 120 to contact the second end 100 of the annular recess 99 preventing further movement in the second direction.

The stopper 120 is arranged adjacent the second end 114 of the collar member 24 and comprises an annular flange which extends around the inner surface of the collar member 24.

In use the prongs 46 of the male plug 12 are aligned with the receptacles 108 of the female plug 20 and are moved such that the prongs 46 are engaged fully within the receptacles 108. The collar member 24 is then moved from the retracted position to the extended position such that the internal thread 118 comes into contact with the external thread 42 of the male member 12. The collar 24 is then rotated in a direction such that the internal threads 118 engage the external threads 42 thereby securing the male and female plugs 12 and 20 together.

To disengage the male and female plugs 12 and 20 from one another the collar member 24 is rotated in an opposite direction thereby disengaging the threads and is moved from the extended position into the retracted position. The plugs 12 and 20 are then pulled apart until the male prongs 46 are free from the receptacles 108 in the female plug 20.

Since the threaded portion 42 on the male plug 12 extends from the first end 28 away from the prongs 46 they do not interfere with the prongs 46 of the male connector. This allows the male connector to be used with a standard female plug on a power cord or with a standard female plug in a wall outlet. The male plug 12 may therefore be used with either the female plug 20 of the present invention or with most standard female electrical plugs. Likewise the female plug 20 may be used with any standard male plug on a power cord or electric device since the collar member 24 may be moved to the retracted position where it will not interfere with the male or female electrical terminals 16 and 26.

In an alternative embodiment see Figures 5 and 6 the female plug 20 may include biasing means 130, such as a compression spring, arranged around the annular recess 99 between the first end 100 and the stopper member 120 on the collar member 24. The spring 130 biases the

stopper 120 and the collar member 24 towards the second end 102 of the annular recess and towards the retracted position. This helps to keep the collar member 24 lying on the female plug body 22 between the first end 66 and the second end 68 so that it does not extend past the first end 66 when not in use, and does not interfere with the female electrical terminals 26.

In use this arrangement is used in the same manner as that described above however the collar member 24 must be forced against the spring 130 when moving the collar 24 to the extended position. The spring 130 is selected such that it applies a biasing force sufficient to hold the collar member 24 in the retracted position but not such that its difficult to move the collar member 24 into the extended position for use.

In another alternative arrangement, see Figure 7, the female plug 20 may be mounted on a supporting surface 138, such as a wall or table top, by a face plate 140 or directly on a supporting surface 138 for use as a mounted outlet instead of being fastened to the end of a cord. In this case the face plate 140 or other supporting surface 138 would be fixed to the first portion of the plug body 22, and instead of having an electrical cord 28 electrical wires 142 would extend through the second opening 80 and into the cavity 76 for connection with the interior ends 112 the receptacles 108, thereby providing power from a power source to the female plug 20.

In another alternative arrangement the external thread and the collar member are reversed with the collar member mounted on the male plug and the external thread arranged on the female plug.

Referring to Figures 9 and 10 the body 150 of the female electrical plug 20B comprises a cylindrical tubular member extending from a

first end 152 to a second end 154 and has an outer cylindrical wall 156. The outer wall 156 extends rearwards at a constant diameter from the first end 152 to a point 158 spaced from the second end 154 and then tapers inwards to a longitudinal centre line 160 to the second end 154. This gives the portion of the plug body 150 adjacent the second end 154 a frusto conical shape.

An external thread 162 extends from the first end 152 along an outer surface of the outer wall 156 of the plug body 150. The external thread 156 is engaged by the cylindrical collar 176 of the male electric plug 12B to hold the male and female plugs together.

The body 170 of the male electrical plug 12B is an elongate tubular member and extends from a first end 172 to a second end 174 and has collar member 176 arranged for movement on an outer surface 178 thereof. An annular recess 180 extends along the outer surface 178 of the body 170 from a first end 182 spaced inwards from the first end 172 of the body 170 to a second end 184 spaced inwards from the second end 174 of the body 170.

The body 170 of the male plug 12B comprises first and second portions 186 and 190 which are removably and reengageably separable at the annular recess 180. This allows the collar 176 to be positioned around and retained on the plug body 12B at the annular recess 180.

In another alternative arrangement, see Figures 11 and 12, the female plug 20B is substantially as described above having an external thread 162 and is mounted on a supporting surface 200, such as a wall or table top, by a face plate 202 or directly on a supporting surface 200. This allows the female plug 20B to be used as a mounted outlet instead of being fastened to the end of a cord. In this case the face plate 202 or other

supporting surface 200 would be fixed to the plug body 20B. Electrical wires 204 extend through the second opening 206 and into the cavity plug body 150 for connection to the receptacles 208, thereby providing power from a power source to the female plug 20B.

Although the term "threads" is used to describe the connection means on the male and female plugs, the term "threads" is meant to be interpreted generally to include fine and coarse screw threads, threads requiring only a partial turn for engagement, and arrangements comprising at least one slot and at least one engagement member for engaging within the slot.

While certain specific embodiments of the present invention have been described in the foregoing, it is to be understood that other embodiments are possible within the scope of the invention. The invention is to be considered limited solely by the scope of the appended claims.

**CLAIMS**

1. An electric connector comprising:

a male electrical plug including a male plug body having a first end, and male electrical terminals comprising a plurality of prongs extending outwards and past the first end of the plug body;

a female electrical plug including a female plug body having a first end, and female electrical terminals comprising a plurality of receptacles extending into the female plug body from the first end thereof and arranged to receive the prongs of the male plug;

a first one of said electrical plugs having an external thread arranged at the first end of the body thereof;

and a second one of said electrical plugs having a cylindrical collar member mounted thereon, said cylindrical collar member having a first end and an internal thread at the first end arranged for cooperation with the external thread;

and wherein the cylindrical collar member is mounted on the body of the second one of the plugs for free rotational movement therearound and for translational movement therealong between a retracted position with the first end of the collar member lying adjacent the first end of the second plug body, and an extended position with the first end of the collar member extending past the first end of the second plug body such that the internal thread can cooperate with the external thread to selectively secure the first one of the plugs to the second one of the plugs.

2. An electric connector in accordance with Claim 1 wherein the body of the second one of the plugs includes an annular recess in an outer surface thereof and spaced from the first end thereof; and wherein the collar member includes a stopper member extending radially into the annular

recess limiting translational movement of the collar member on said body between the retracted and extended positions.

3. An electric connector in accordance with Claim 2 wherein the collar member has a second end opposite the first end and wherein the stopper is arranged adjacent the second end of the collar member.

4. An electric connector in accordance with Claim 2 wherein the stopper member is an annular flange extending around an inner surface of the collar member.

5. An electric connector in accordance with Claim 2 wherein the body of the second one of the plugs comprises first and second portions removably and reengagably separable at the annular recess.

6. An electric connector in accordance with Claim 4 wherein the body of the second one of the plugs comprises:

a second end opposite the first end;

a first tubular portion extending from the first end of the plug body to a second end, said first tubular portion having an annular recess spaced from the first end of the plug body and extending to the second end thereof, and an inner cavity extending longitudinally therethrough;

a second tubular portion extending from a first end adjacent the second end of the first tubular portion to the second end of the plug body, said second tubular portion having an inner cavity extending longitudinally therethrough, and a first opening arranged at the first end thereof;

and removable and reengagable connection means for connecting the first and second portions.

7. An electric connector in accordance with Claim 6 wherein removable and reengagable connection means comprise an external thread arranged at the second end of the first portion, and an internal thread at the

first end of the second portion, said threads being arranged for cooperation with one another.

8. An electric connector in accordance with Claim 1 wherein the male electrical plug includes an electrical power cord having an end arranged such that it is electrically connected to the plurality of prongs for communication of electricity therefrom.

9. An electric connector in accordance with Claim 8 wherein the male electrical plug includes:

a second end of the plug body opposite the first end thereof;

an inner cavity extending from the first end to the second end of the plug body,

a opening arranged at the second end,

the electrical power cord extending through the opening and into the cavity to the end thereof;

and fixing means for fixing the electrical power cord to the second end of the plug body.

10. An electric connector in accordance with Claim 1 wherein the female electrical plug includes an electrical power cord having an end arranged such that the end of the electrical power cord is electrically connected to the plurality of receptacles for communication of electricity thereto.

11. An electric connector in accordance with Claim 10 wherein the female electrical plug includes:

an inner cavity extending from the first end to the second end of the plug body,

an opening arranged at the second end,

the electrical power cord extending through the opening and into the cavity to the end thereof;

and fixing means for fixing the electrical power cord to the second end of the plug body.

12. An electric connector in accordance with Claim 1 wherein the first one of the electrical plugs is the male plug.

13. An electric connector in accordance with Claim 1 wherein the second one of the electrical plugs is the male plug.

14. An electric connector in accordance with Claim 1 wherein the body of the female electrical plug includes:

a second end fixed to a supporting surface;

an inner cavity extending from the first end to the second end of the plug body,

a opening arranged at the second end,

electrical wiring extending through the supporting surface and the opening, into the cavity to an end arranged such that the end of the electrical wiring is electrically connected to the plurality of receptacles for communication of electricity thereto.

15. An electric connector for use with a female electrical plug having an external thread thereon comprising:

a male electrical plug including a plug body having a first end, and male electrical terminals comprising a plurality of prongs extending outwards and past the first end of the plug body;

and a cylindrical collar member mounted on the male plug body, said cylindrical collar member having a first end and an internal thread at the first end;

and wherein the cylindrical collar member is mounted on the body of the male plug for free rotational movement therearound and for translational movement therealong between a retracted position with the first end of the collar member lying adjacent the first end of the male plug body, and an extended position with the first end of the collar member extending past the first end of the male plug body such that the internal thread can cooperate with the external thread on the female plug body to removably and reengagably secure the male electrical plug to the female electrical plug.

16. An electric connector for use with a male electrical plug having an internal thread thereon comprising:

a female electrical plug including a female plug body having a first end, and female electrical terminals comprising a plurality of receptacles extending into the female plug body from the first end thereof and arranged to receive the prongs of the male plug;

and an external thread arranged at the first end of the plug body thereof, arranged such that the external thread can cooperate with the internal thread on the male plug to removably and reengagably secure the male electrical plug to the female electrical plug.

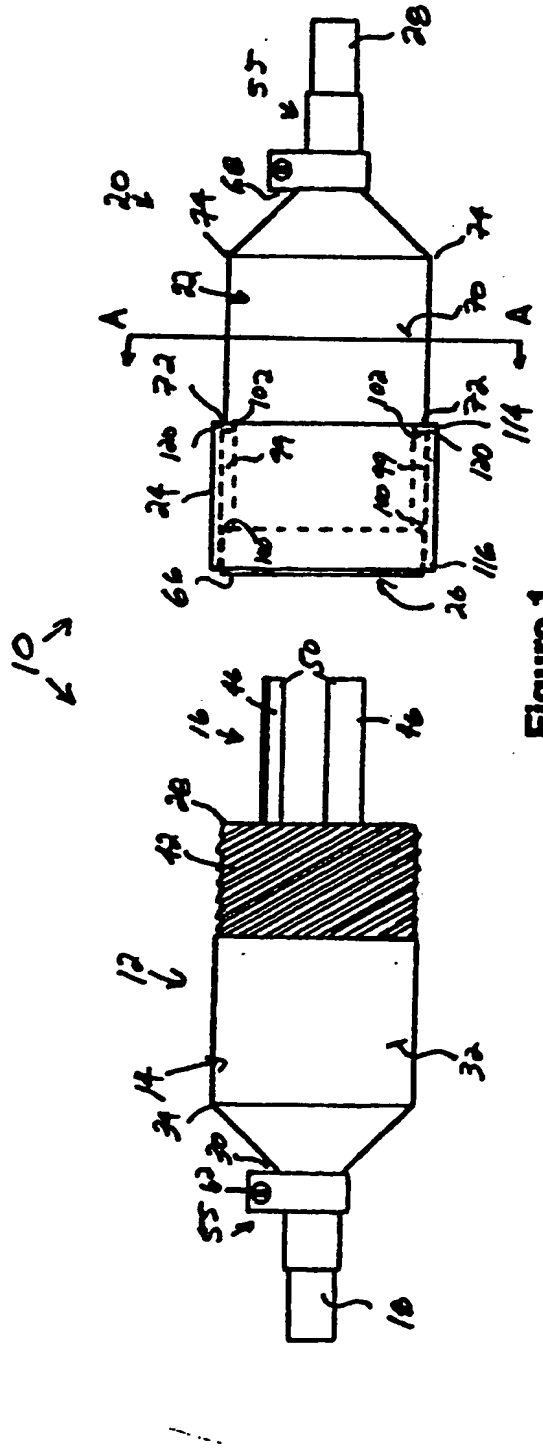

Figure 1

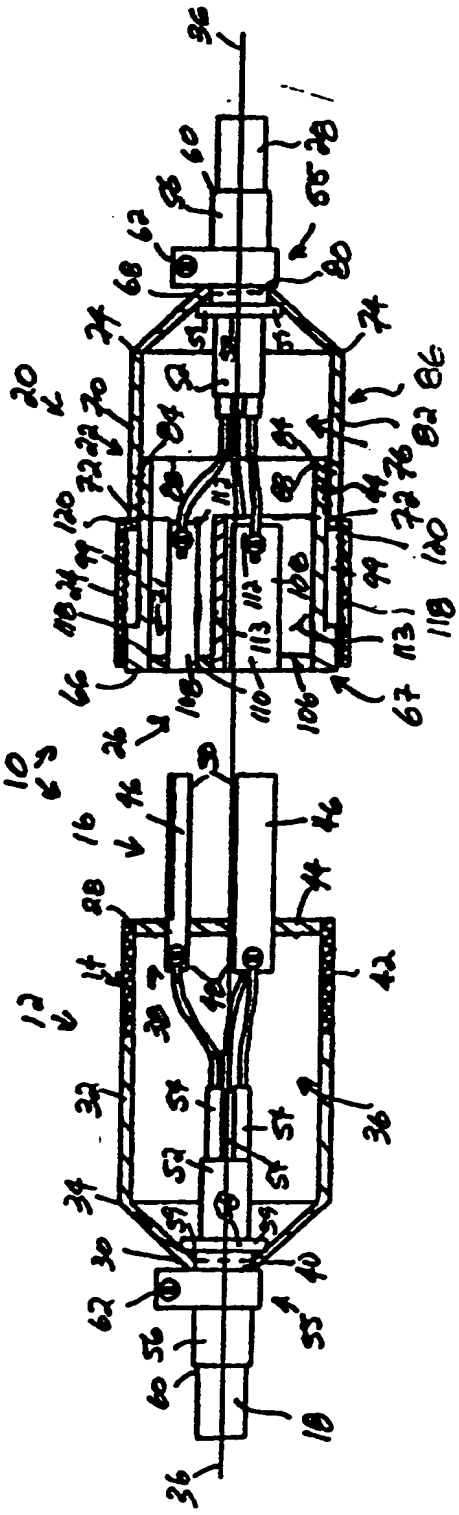

Figure 2

INVENTOR: GEORGE C. BRADLEY

By: *ADE & COMPANY*

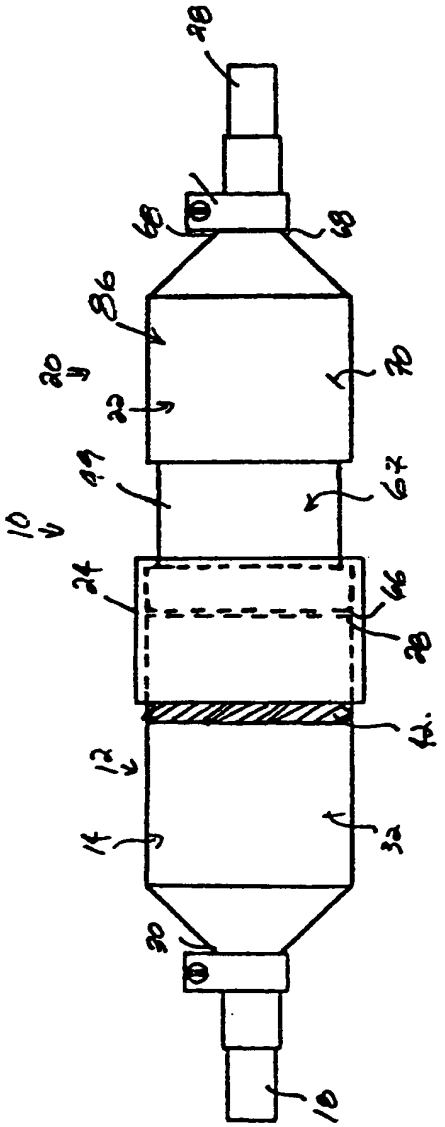

Figure 3

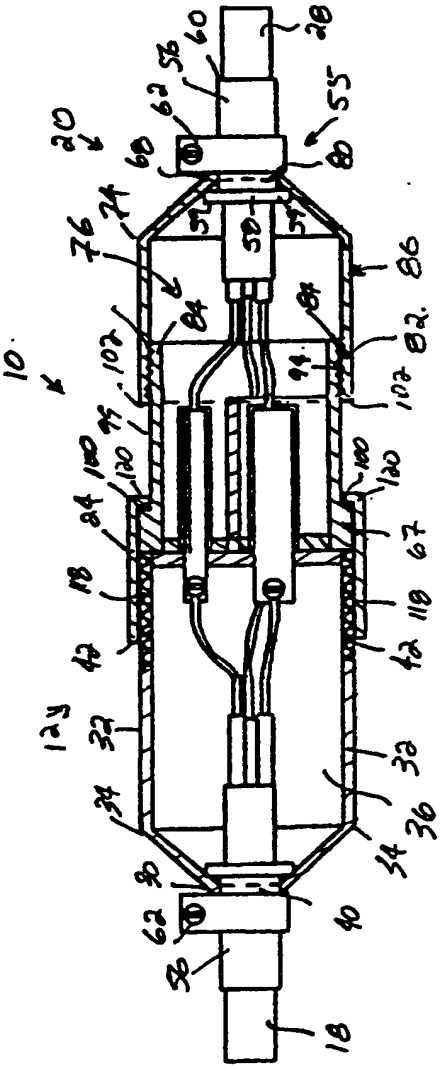

Figure 4

INVENTOR: GEORGE C. BRADLEY
By: *ADE & COMPANY*

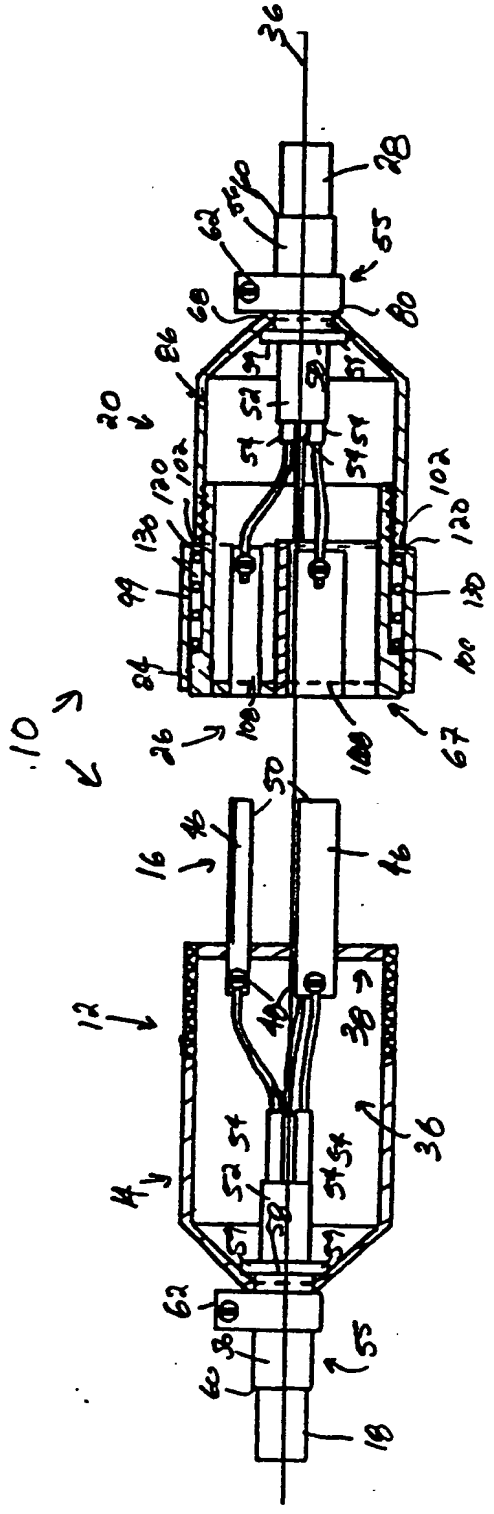

Figure 5

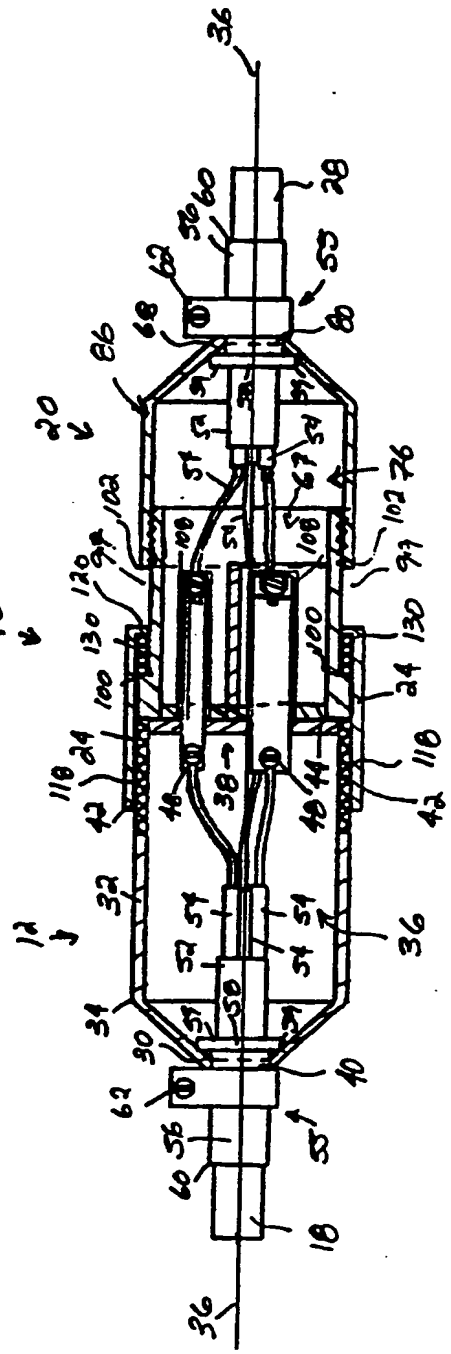

Figure 6

INVENTOR: GEORGE C. BRADLEY

By: *ADE & COMPANY*

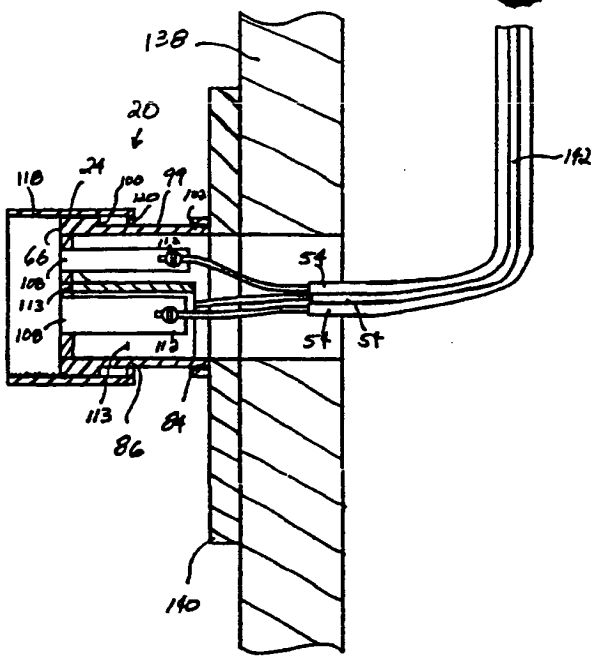


Figure 7

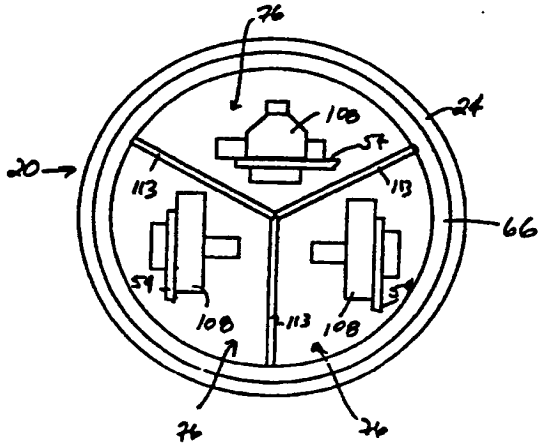


Figure 8

INVENTOR: GEORGE C. BRADLEY
By: *ADE & COMPANY*

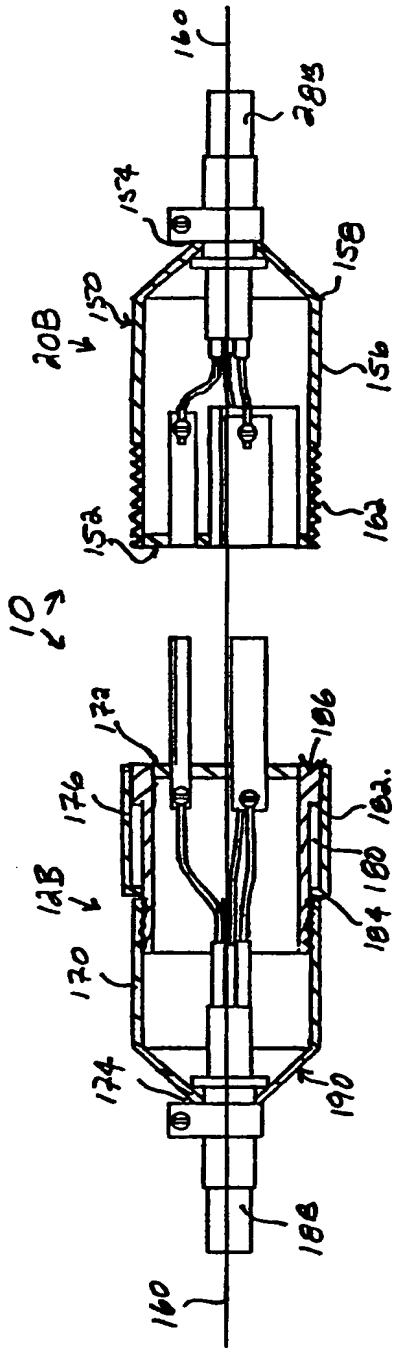


Figure 9

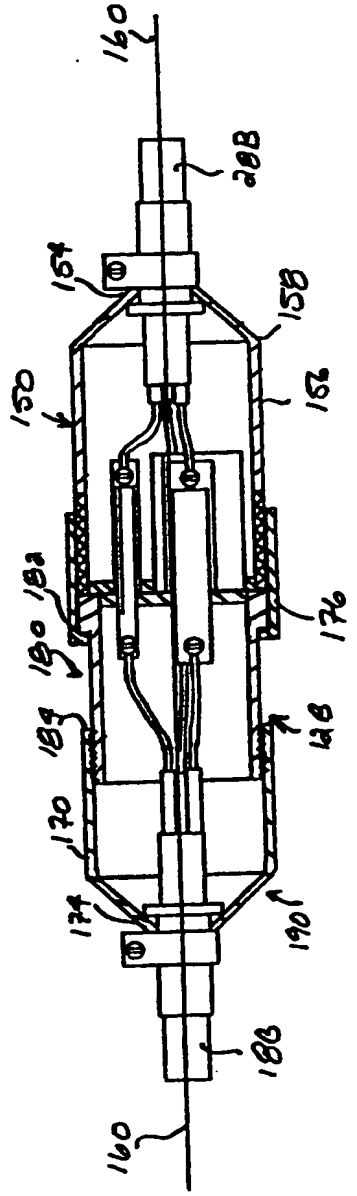


Figure 10

INVENTOR: GEORGE C. BRADLEY
By: *ADE & COMPANY*

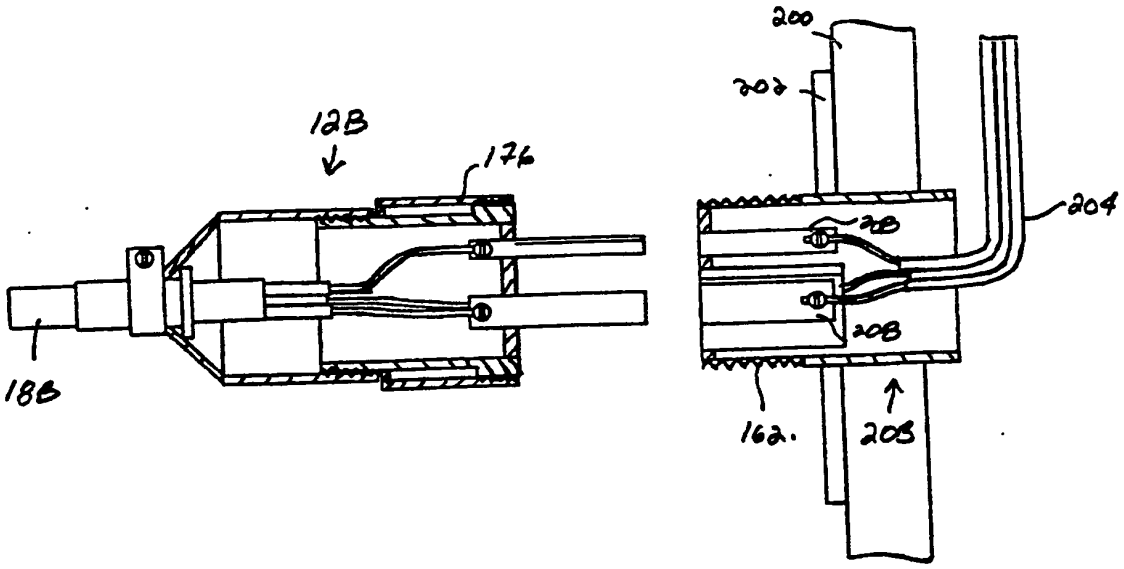


Figure 11

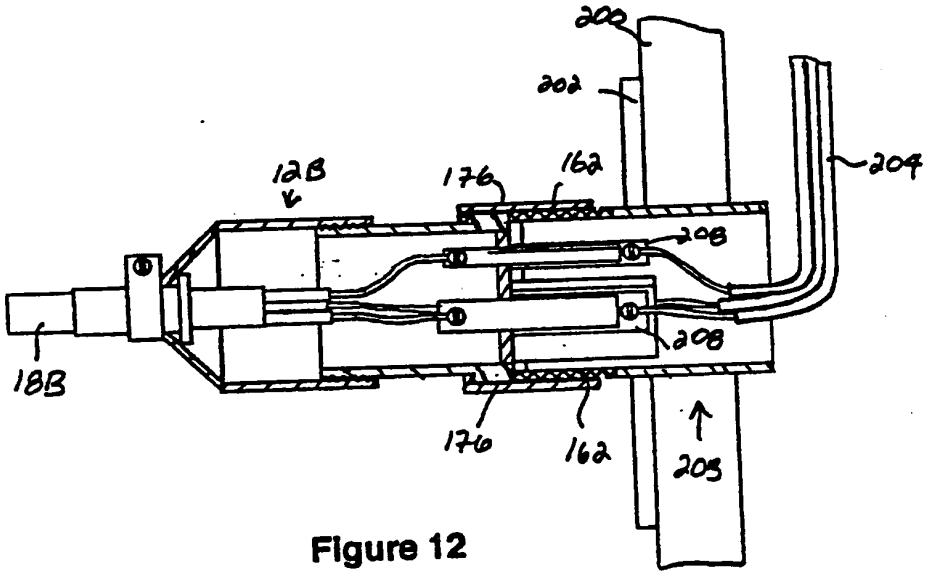


Figure 12

INVENTOR: GEORGE C. BRADLEY
By: *ADE & COMPANY*